## What is claimed is:

1. A signal acquisition instrument, comprising:

an input stage referenced to a first ground, said input stage for receiving an input signal;

a memory for storing information related to said input signal;

an instrumentation network referenced to a second ground, said

instrumentation network for processing information from said memory; and

a switch network having at least two switches for selectively switching

10 said memory between said first and second grounds;

wherein said first and second grounds are electrically isolated.

2. The signal acquisition instrument of claim 1 wherein said switch network includes at least one semiconductor switch.

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- 3. The signal acquisition instrument of claim 1 wherein at least one switch is a break-before-make switch.
- 4. The signal acquisition instrument of claim 1 wherein said switch network20 selectively connects said memory to said input stage.
  - 5. The signal acquisition instrument of claim 1 wherein said switch network selectively connects said memory to said instrumentation network.
- 25 6. The signal acquisition instrument of claim 1 wherein said memory is a digital memory.
  - 7. The signal acquisition instrument of claim 1 wherein said memory is an analog memory.

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8. The signal acquisition instrument of claim 1 wherein said an instrument network includes a display.

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- 9. The signal acquisition instrument of claim 1 wherein said second ground is electrically connected to an AC power ground line.
- 10. An oscilloscope, comprising:
- an input stage referenced to a first ground, said input stage for receiving an input signal;

a memory for storing information related to said input signal; an instrumentation network referenced to a second ground, said instrumentation network for processing information from said memory;

a display for displaying a waveform representation of said input signal;

a switch network having at least two switches for selectively switching said memory between said first ground and said second ground;

wherein said first and second grounds are electrically isolated.

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- 11. The oscilloscope of claim 10 wherein said switch network includes at least one semiconductor switch.
- 12. The oscilloscope of claim 10 wherein at least one switch is a break-20 before-make switch.
  - 13. The oscilloscope of claim 10 wherein said switch network selectively connects said memory to said input stage.
- 25 14. The oscilloscope of claim 10 wherein said switch network selectively connects said memory to said instrumentation network.
  - 15. The oscilloscope of claim 10 wherein said memory is a digital memory.
- 30 16. The oscilloscope of claim 10 wherein said memory is an analog memory.
  - 17. The oscilloscope of claim 10 wherein said oscilloscope is a digital storage oscilloscope.

- 18. The oscilloscope of claim 10 wherein said second ground is electrically connected to an AC power ground line.
- 5 19. A method of acquiring a signal comprising: receiving a signal referenced to a first ground; storing information about the received signal in a memory referenced to the first ground;

disconnecting the memory from the first ground;
referencing the memory to a second ground; and
processing the stored information using a system referenced to the
second ground.

20. The method of claim 19 further including the step of displaying awaveform representation of the received signal.